

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-7 (canceled).

Claim 8 (previously presented) A superconducting circuit comprising:

a single flux quantum circuit using a high temperature superconductor; and

an interface circuit for said single flux quantum circuit,

wherein said single flux quantum circuit is provided with a first Josephson junction, and said interface circuit is provided with a second Josephson junction made from a combination of materials different from those of said first Josephson junction,

wherein hysteresis in the current-voltage characteristic of said first Josephson junction is smaller than hysteresis in the current-voltage characteristic of said second Josephson junction,

wherein said first Josephson junction comprises:

a lower electrode made from La-doped YBaCuO;

an upper electrode made from YbBaCuO; and

a damage layer formed between the lower electrode and the upper electrode, serving as a barrier, and

wherein said second Josephson junction comprises:

a lower electrode made from La-doped YBaCuO;

an upper electrode made from La-doped YbBaCuO; and
a layer made from LaSrAlTaO in addition to a damage layer formed between the lower electrode and the upper electrode, serving as a barrier.

Claim 9 (previously presented) A superconducting circuit comprising:
a single flux quantum circuit using a high temperature superconductor; and
an interface circuit for said single flux quantum circuit,
wherein said single flux quantum circuit is provided with a first Josephson junction, and
said interface circuit is provided with a second Josephson junction made from a combination of materials different from those of said first Josephson junction,

wherein hysteresis in the current-voltage characteristic of said first Josephson junction is smaller than hysteresis in the current-voltage characteristic of said second Josephson junction,

wherein said interface circuit is formed of a latch driver circuit,
wherein said first Josephson junction comprises:
a lower electrode made from La-doped YBaCuO;
an upper electrode made from YbBaCuO; and
a damage layer formed between the lower electrode and the upper electrode, serving as a barrier, and

wherein said second Josephson junction comprises:
a lower electrode made from La-doped YBaCuO;
an upper electrode made from La-doped YbBaCuO; and
a layer made from LaSrAlTaO in addition to a damage layer formed between the lower

electrode and the upper electrode, serving as a barrier.

Claim 10 (previously presented) A superconducting circuit comprising:
a single flux quantum circuit using a high temperature superconductor; and
an interface circuit for said single flux quantum circuit,
wherein said single flux quantum circuit is provided with a first Josephson junction, and
said interface circuit is provided with a second Josephson junction made from a combination of
materials different from those of said first Josephson junction,

wherein hysteresis in the current-voltage characteristic of said first Josephson junction is
smaller than hysteresis in the current-voltage characteristic of said second Josephson junction,

wherein a junction in which hysteresis in the current-voltage characteristic is 10% or less
is used for said first Josephson junction and a junction in which hysteresis in the current-voltage
characteristic is 10% or more is used for said second Josephson junction,

wherein said first Josephson junction comprises:
a lower electrode made from La-doped YBaCuO;
an upper electrode made from YbBaCuO; and
a damage layer formed between the lower electrode and the upper electrode, serving as a
barrier, and

wherein said second Josephson junction comprises:
a lower electrode made from La-doped YBaCuO;
an upper electrode made from La-doped YbBaCuO; and
a layer made from LaSrAlTaO in addition to a damage layer formed between the lower

electrode and the upper electrode, serving as a barrier.

Claim 11 (withdrawn) The superconducting circuit according to claim 1, wherein said first Josephson junction comprises: a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a damage layer formed between the lower electrode and the upper electrode, serving as a barrier, and wherein said second Josephson junction comprises: a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a layer made from LaSrAlTaO in addition to a damage layer formed between the lower electrode and the upper electrode, serving as a barrier.

Claim 12 (withdrawn) The superconducting circuit according to claim 2, wherein said first Josephson junction comprises: a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a damage layer formed between the lower electrode and the upper electrode, serving as a barrier, and wherein said second Josephson junction comprises; a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a layer made from LaSrAlTaO in addition to a damage layer formed between the lower electrode and the upper electrode, serving as a barrier.

Claim 13 (withdrawn) The superconducting circuit according to claim 3, wherein said first Josephson junction comprises: a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a damage layer formed between the lower electrode and the upper electrode, serving as a barrier, and wherein said second Josephson

junction comprises: a lower electrode made from La-doped YBaCuO; an upper electrode made from La-doped YbBaCuO; and a layer made from LaSrAlTaO in addition to a damage layer formed between the lower electrode and the upper electrode, serving as a barrier.

Claim 14 (withdrawn) The superconducting circuit according to claim 1, wherein said single flux quantum circuit is provided with a ground plane made from La-doped YBaCuO to restrain inductance in the single flux quantum circuit.

Claim 15 (withdrawn) The superconducting circuit according to claim 2, wherein said single flux quantum circuit is provided with a ground plane made from La-doped YBaCuO to restrain inductance in the single flux quantum circuit.

Claim 16 (withdrawn) The superconducting circuit according to claim 3, wherein said single flux quantum circuit is provided with a ground plane made from La-doped YBaCuO to restrain inductance in the single flux quantum circuit.

Claim 17 (withdrawn) The superconducting circuit according to claim 1, wherein said single flux quantum circuit and said interface circuit are structured to be a multi-chip module.

Claim 18 (new) The superconducting circuit according to claim 8, wherein said first Josephson junction and said second Josephson junction are each formed by a ramp edge junction

U.S. Patent Application Serial No. **10/809,919**
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Claim 19 (new) The superconducting circuit according to claim 9, wherein said first Josephson junction and said second Josephson junction are each formed by a ramp edge junction.

Claim 20 (new) The superconducting circuit according to claim 10, wherein said first Josephson junction and said second Josephson junction are each formed by a ramp edge junction.